

CLAIMS

We claim:

1. An ejector comprising:

a nozzle for ejecting a fluid;

5 a needle disposed coaxial with said nozzle and having a tip end

portion which faces said nozzle; and

needle moving means for causing said needle to advance and retreat
axially,

wherein a shape of said tip end portion of said needle is set such that an
10 opening area of a gap between said tip end portion of said needle and said nozzle
and amount of movement produced by said needle moving means satisfy a
proportional relationship.

2. The ejector according to claim 1, wherein said tip end portion of said

15 needle has a conical shape.

3. The ejector according to claim 1, wherein said tip end portion of said
needle has a quadratic surface shape.

20 4. The ejector according to claim 1, wherein when an opening area of
said nozzle in a state where said needle is not positioned in the position of said
nozzle is set as A, a radius of said tip end portion of said needle in the position of
said nozzle is set as X, an amount of movement produced by said needle moving
means in a retreating direction from said nozzle is set as Z, and K is a constant, said
25 tip end portion of said needle is shaped such that

$$X^2 = (A-KZ)/\pi$$

is established.

5. An ejector comprising:

5 a nozzle for ejecting a fluid;
a needle disposed coaxial with said nozzle and having a paraboloidal
tip end portion which faces said nozzle; and
needle moving means for causing said needle to advance and retreat
axially.

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6. The ejector according to any one of claims 1 through 5, wherein said
needle moving means comprises:

a piston connected to a base end portion of said needle, said piston
including a front surface and a rear surface to which a fluid is led; and

15 a biasing member for biasing said rear surface of said piston toward
said tip end portion of said needle,

wherein said needle advances and retreats on the basis of a balance
between a differential fluid pressure on said piston and a biasing force of said biasing
member.

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7. The ejector according to claim 6, wherein said fluid which is led to
said rear surface of said piston is a fluid which is ejected through said nozzle or a
fluid which is aspirated upon ejection through said nozzle.

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8. A fuel cell system comprising the ejector according to any one of

claims 1 through 7, said ejector being incorporated into piping of said fuel cell system,

wherein said ejector combines a new fluid supplied to a fuel cell with a fluid discharged from said fuel cell and supplies the resulting mixture to said fuel cell.

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